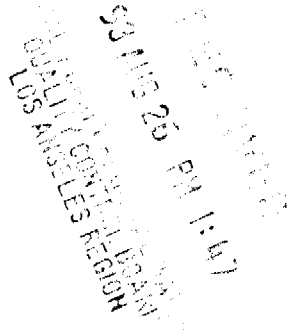
SOIL GAS SURVEY REPORT

NUPLA CORPORATION SITE
11912 SHELDON STREET
SUN VALLEY, CALIFORNIA
(LARWQCB FILE NO. 111.0788)



Prepared for:

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August 20, 1993

LIMITATIONS AND WARRANTIES

This Soil Gas Survey Report has been prepared for the exclusive use of NUPLA Corporation and assigned interested parties. The report has been prepared in accordance with generally accepted environmental assessment practices. No other warranty, expressed or implied, is made.

The information provided in this report is based on measurements performed in specific areas during a specific limited period of time. In the event that any changes occur in waste management practices, site conditions, or uses of the property, the conclusions and recommendations contained in this Soil Gas Survey Report should be reviewed and modified or verified in writing by Environmental Support Technologies, Inc.

Soil gas sample analyses are conducted using laboratory-grade gas chromatography equipment. Chemical compound identification is performed using quantitative methods. Chemical compound identities should be verified using gas chromatography/mass spectrometric analyses methods. Soil gas survey data should be used in conjunction with other site specific data.

K. A. Thomson

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Project Manager/Principal Hydrogeologist

1.0 INTRODUCTION

On August 12 and 13, 1993, Environmental Support Technologies, Inc. (EST) performed a soil gas survey at the NUPLA Corporation site located at 11912 Sheldon Street in Sun Valley, California. This Soil Gas Survey Report was prepared based on soil gas analyses data collected during the survey.

The soil gas survey included the installation, sampling, and analysis of twenty-eight (28) soil gas probes in areas specified by Los Angeles Regional Water Quality Control Board (LARWQCB) in a letter dated August 4, 1993. The number of probes installed included twenty-seven (27) 5-foot probes, and one (1) 10-foot probe. The approximate locations of the soil gas sampling probes are shown in Figure 1.

2.0 OBJECTIVES OF THE SOIL GAS SURVEY

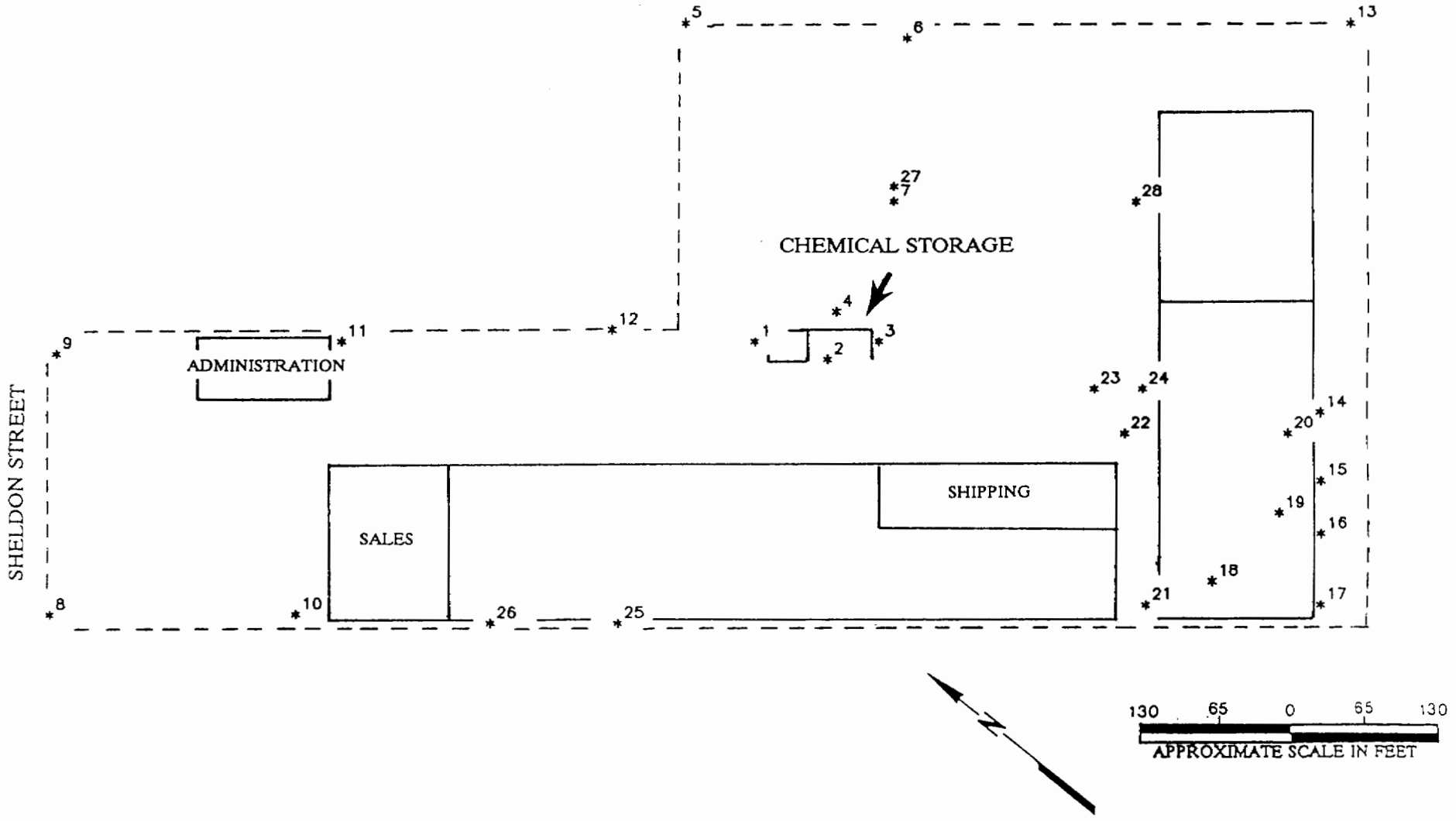
The objectives of the soil gas survey were to:

- Aid in identifying potential vadose zone source areas of selected volatile organic compounds (VOCs) including aromatic and halogenated hydrocarbons.
- Assess the lateral extent of potential shallow soil contamination by selected VOCs.
- Supply data to aid in the effective placement of soil borings, if necessary.

Soil gas sampling is a monitoring technique for soil contamination by VOCs and should be used in conjunction with other data. Soil gas sampling is limited in its applications depending on site-specific conditions. Some factors affecting the distribution of VOCs in the subsurface are listed in Appendix A.

3.0 RATIONALE FOR THE LOCATIONS OF SAMPLING SITES

Soil gas probe locations were selected to investigate the lateral and limited vertical extent of soil potentially impacted by VOCs. Soil gas probe sites were located based on guidelines imposed by the LARWQCB as referenced above. Soil gas probes were located to investigate the chemical storage area, the chemical/waste storage area, the injection molding area, the area adjacent to the injection molding area, and the perimeter of the main building.



EXPLANATION:
* APPROXIMATE LOCATION OF A SOIL GAS SAMPLING PROBE

SOURCE OF BASE MAP:
NUPLA CORPORATION

FIGURE 1
APPROXIMATE LOCATIONS OF
SOIL GAS SAMPLING PROBES
NUPLA CORPORATION SOIL GAS SURVEY

4.0 METHODS AND PROCEDURES

Soil gas samples were collected using perforated soil gas probe points, Teflon™ tubing, and a vacuum pump with instrumentation assembly. Analyses of soil gas samples were conducted immediately following collection using a laboratory-grade gas chromatograph.

4.1 PROBE INSTALLATION

Construction of a typical soil gas sampling probe is shown in Figure 2. Probes were installed using a percussion hammer. Once probes were installed to the desired depth, the hollow probe drive-rod was withdrawn, leaving the stainless steel probe point and Teflon™ sampling tube in the subsurface. A small amount of silica sand was poured around the probe tip to allow for diffusion of soil vapors. The remaining annulus was filled with hydrated bentonite clay to the ground surface. The probe point and sampling tube assembly were left in place (dedicated) as a long-term soil gas monitoring point. Dedicated soil gas probes allow for future soil gas sampling and analysis, if necessary.

4.2 SAMPLE COLLECTION AND HANDLING

Soil gas samples were collected using the soil gas sampling system shown in Figure 3. A site-specific probe purging and sample volume calibration was initially performed to evaluate the appropriate volume of gas to be purged from each probe prior to sample collection. Time-series sampling of at least one probe was conducted to evaluate trends in soil gas concentrations as a function of purge volume.

4.3 SAMPLE ANALYSIS

Soil gas samples were analyzed by direct gas injection into a Varian 3400 gas chromatograph equipped with a photoionization detector (PID) and an electrolytic conductivity detector (ELCD or Hall) configured in series. Soil gas samples were analyzed for EPA Method 8010/8020 compounds including common aromatic and halogenated hydrocarbons. Detection limits for the EPA Method 8010/8020 compounds were 1.0 microgram per liter (μg/l) of gas.

4.4 EQUIPMENT CALIBRATION

The chromatographic equipment used for soil gas analyses was calibrated using high-purity solvent-based standards obtained from certified vendors. Standards were prepared in high-purity methanol or dodecane solvent. Calibration using solvent-based standards was performed using varying injection volumes of the stock solvent-based standard without dilution. Stock solvent-based standards were diluted to an appropriate concentration, if necessary. Diluted standards were prepared by introducing a known volume of stock solvent-based standard into a known volume of high-purity solvent.

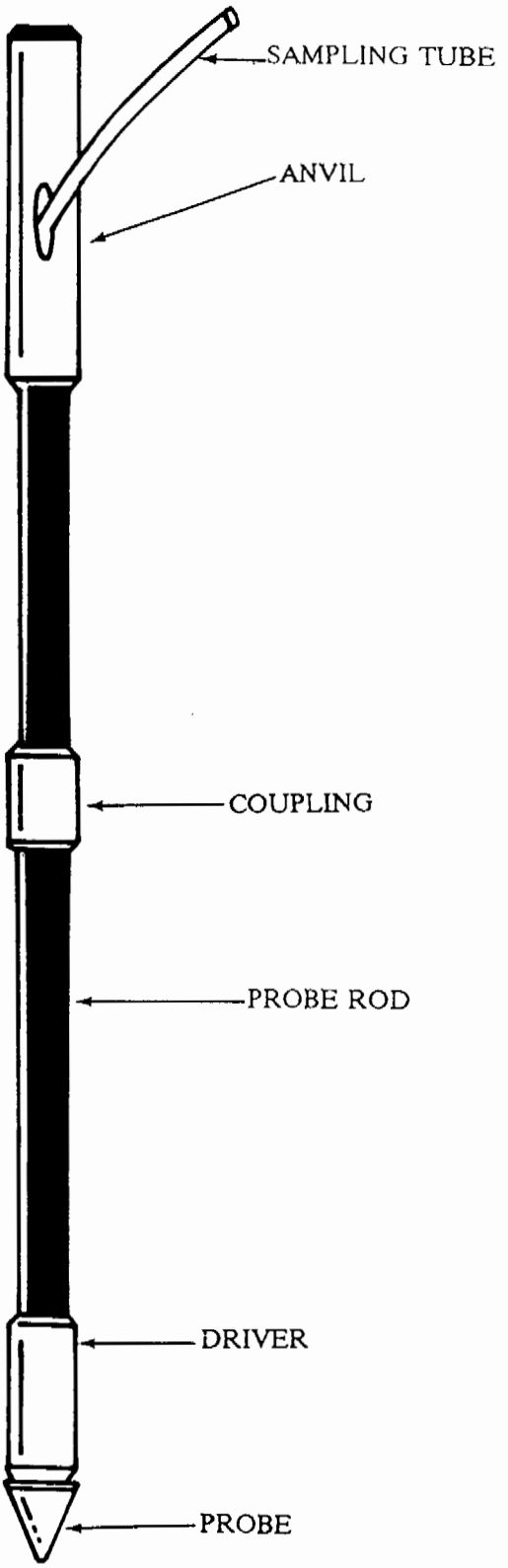
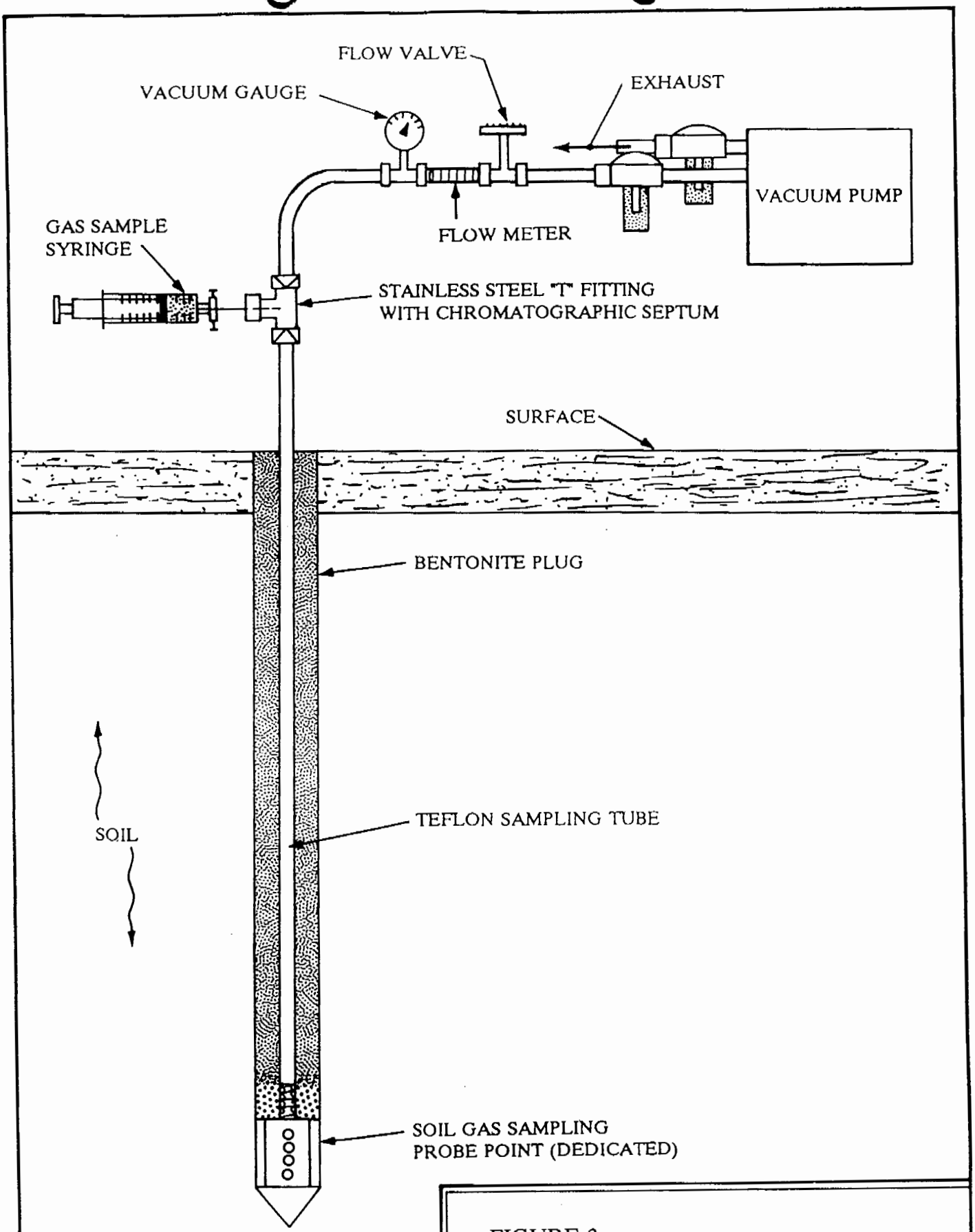


FIGURE 2
TYPICAL CONSTRUCTION OF A
SOIL GAS SAMPLING PROBE
NUPLA CORPORATION SOIL GAS SURVEY

NOTE: NOT TO SCALE



NOTE: NOT TO SCALE

FIGURE 3
SOIL GAS SAMPLING SYSTEM
NUPLA CORPORATION SOIL GAS SURVEY

Initial calibration was performed for EPA Method 8010/8020 compounds. The gas chromatograph was calibrated using three standard injections to establish a three-point calibration curve. The lowest standard concentration was no higher than three times the Method Detection Limit (or 3 μg/L). Identification and quantitation of compounds in the field was based on calibration under the same analytical conditions as for three-point calibration.

Daily calibration of the gas chromatograph in the field consisted of a minimum of nine (9) calibration standards, including 3 aromatic compounds and 6 halogenated compounds representing short, medium, and long retention time groups. Daily calibration was performed prior to the first sample analysis of the day. One-point calibration was performed for all compounds detected at a particular site to ensure accurate quantitation. If the response factor for each of the compounds was not within 15 percent of the corresponding value from the three-point calibration, the GC was re-calibrated. Subsequent calibration episodes consisted of at least one injection of the standard exhibiting a similar detector response as that of samples encountered in the field.

4.5 BLANKS

The sample collection system consisted of stainless-steel and Teflon™ components. Each soil gas sampling syringe was blanked with helium gas before use. Prior to sampling the syringe used for soil gas sample collection was filled with ambient air or ultra-high-purity carrier-grade gas from a compressed gas cylinder. The ambient air or high-purity gas was injected directly into the gas chromatograph. This sample injection served as a blank to detect potential cross-contamination of the syringe.

4.6 DECONTAMINATION

Probes and equipment in contact with the soil gas sample stream were decontaminated prior to sampling. Decontamination of soil gas sampling equipment was performed by repeated washing and/or by baking in the gas chromatograph oven. Washing included the use of a phosphate-free detergent wash, tap water rinse, and was followed by air drying.

4.7 QUALITY CONTROL (QC) CHECK SAMPLE

Two QC check samples (obtained from a source different from the Daily Calibration Standard) were analyzed each working day (one at the beginning and one at the end) bracketing the analysis of environmental samples. A minimum of 9 compounds as described above, were checked. Responses for each compound were required to be within 20 percent of the corresponding true value. If the initial QC Check sample failed the requirement, the problem was resolved before proceeding with sample analysis. If the final QC check sample failed the above requirement, additional QC check samples were run to meet the QC requirement.

4.8 REPORTING OF SAMPLE RESULTS AND QA/QC INFORMATION

Reporting of sample results and QA/QC information is provided in accordance with the Los Angeles Regional Water Quality Control Board's "QA/QC and Reporting Requirement for Soil Gas Investigation" dated November 5, 1992.

5.0 RESULTS AND INTERPRETATIONS

A summary of field analyses results for soil gas samples collected at the NUPLA Corporation site is provided in Table 1. Field analyses reports for soil gas samples, GC calibration and QC reports, and criteria for method detection limits are provided in Appendix B.

Soil gas samples collected during the recent survey contained concentrations of trichloroethene (TCE), 1,1,1-trichloroethane (TCA), cis-1,2-dichloroethene (cis-1,2-DCE), tetrachloroethene (PCE), 1,1-dichloroethene (DCE), methylene chloride, toluene, ethylbenzene, and xylenes. Soil gas concentration contours for TCE, TCA, cis-1,2-DCE, and toluene at 5-feet below grade are shown in Figures 4, 5, 6, and 7, respectively.

Soil gas concentrations of TCE were detected in 18 of 28 probes sampled. Detected concentrations of TCE ranged from 1.0 micrograms per liter (μg/L) in Probe SG-1 to a maximum of 283.7 μg/L in Probe SG-7. Probe SG-7 was installed at 5-feet below grade and is located due west of the chemical storage area. TCE was also detected at a concentration of 174.7 μg/L in Probe SG-27, installed at 10-feet below grade and located adjacent to Probe SG-7.

Soil gas concentrations of TCA were detected in 13 of 28 probes sampled. Detected concentrations of TCA ranged from a maximum 9.8 μg/L in Probe SG-24, to 1.3 μg/L in in Probe SG-2. Probe SG-24 is located in the vicinity of the injection/molding area.

Soil gas concentrations of cis-1,2-DCE were detected in 4 of 28 probes sampled. Detected concentrations of cis-1,2-DCE ranged from 1.4 μg/L in Probe SG-24 to a maximum of 70.1 μg/L in Probe SG-7.

Soil gas concentrations of toluene were detected in 2 of 28 probes sampled. Detected concentrations of toluene ranged from 3.1 μg/L in Probe SG-1 to a maximum of 46.0 μg/L in Probe SG-3. Probe SG-3 is located on the south-east side of the chemical storage area.

Soil gas concentrations of methylene chloride were detected in 2 of 28 probes sampled. Detected concentrations of methylene chloride ranged from 1.6 μg/L in Probe SG-8 to a maximum of 25.8 μg/L in Probe SG-10. Soil gas probe SG-10 is located adjacent to the western corner of the sales building.

TABLE 1
SUMMARY OF FIELD ANALYSES DATA
NUPLA CORPORATION
11912 SHELDON STREET, SUN VALLEY, CALIFORNIA
LARWQCB FILE No. 111.0788

(concentrations are reported in micrograms per liter (ug/L))

Prepared: 8/17/93

File: #65/1127T1.WK3

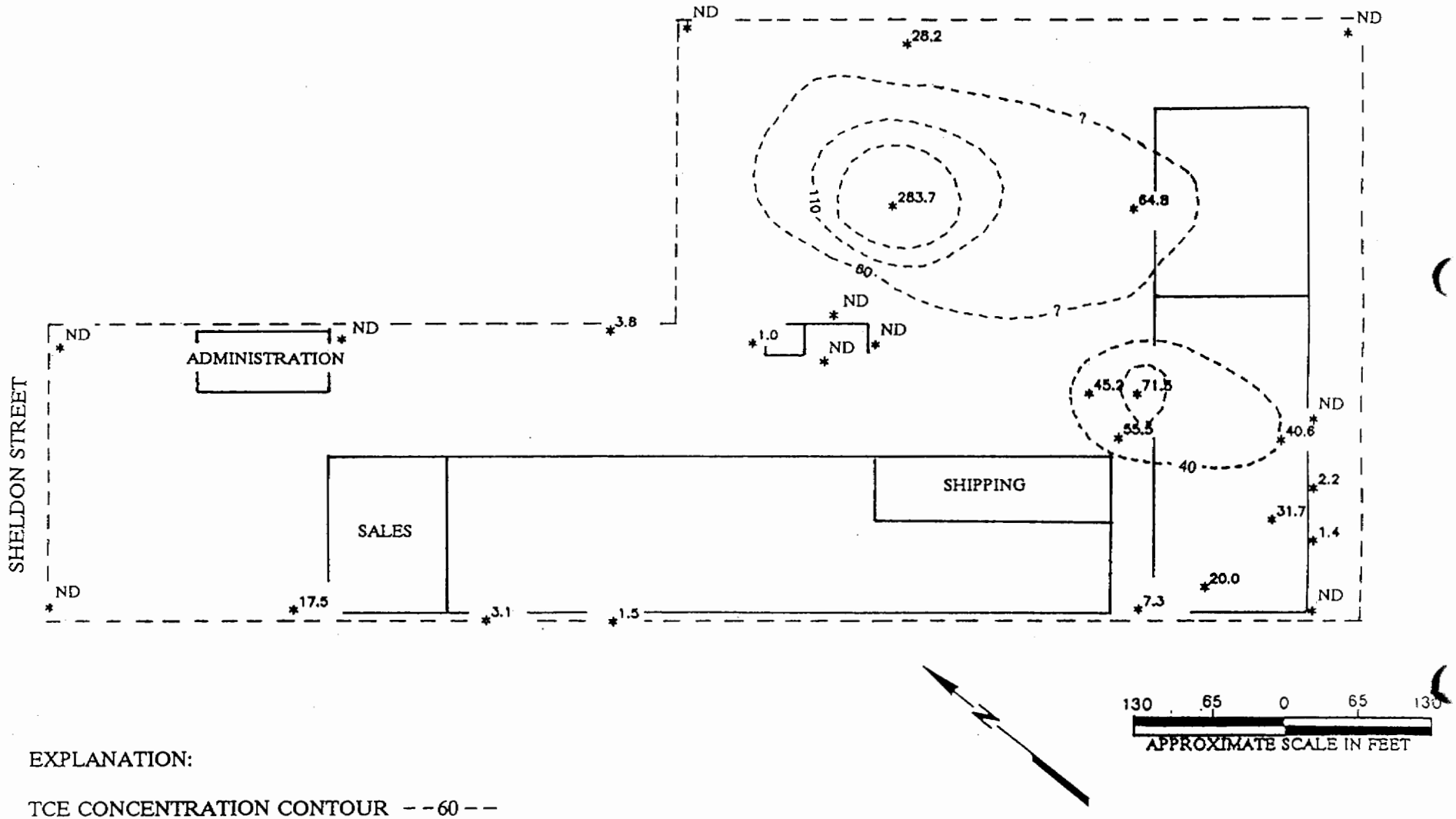
PROBE	DEPTH (feet)	DATE SAMPLED	NUMBER OF TIMES SAMPLED	PCE	TCA	TCE	DCE	cis-1,2-DCE	MC	TOL	EBENZ	TOTAL XYLENES
SG-1	5	8/12/93	1	ND	ND	1.0	ND	ND	ND	3.1	ND	17.3
SG-2	5	8/12/93	1	ND	1.3	ND	ND	ND	ND	ND	ND	ND
SG-3	5	8/12/93	3	ND	ND	ND	ND	ND	ND	46.0	3.6	8.4
SG-4	5	8/12/93	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
SG-5	5	8/12/93	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
SG-6	5	8/12/93	1	ND	2.8	28.2	ND	ND	ND	ND	ND	ND
SG-7	5	8/12/93,8/13/93	2	2.1	5.6	283.7	1.0	70.1	ND	ND	ND	ND
SG-8	5	8/12/93	1	ND	ND	ND	ND	ND	1.6	ND	ND	ND
SG-9	5	8/12/93	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
SG-10	5	8/12/93	1	ND	2.6	17.5	ND	ND	25.8	ND	ND	ND
SG-11	5	8/12/93	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
SG-12	5	8/13/93	1	ND	ND	3.8	ND	ND	ND	ND	ND	ND
SG-13	5	8/13/93	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
SG-14	5	8/13/93	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
SG-15	5	8/13/93	1	ND	ND	2.2	ND	ND	ND	ND	ND	ND
SG-16	5	8/13/93	1	ND	ND	1.4	ND	ND	ND	ND	ND	ND
SG-17	5	8/13/93	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
SG-18	5	8/13/93	1	ND	3.5	20.0	ND	ND	ND	ND	ND	ND
SG-19	5	8/13/93	1	ND	3.4	31.7	ND	ND	ND	ND	ND	ND
SG-20	5	8/13/93	1	ND	4.0	40.6	ND	ND	ND	ND	ND	ND
SG-21	5	8/13/93	1	ND	1.8	7.3	ND	ND	ND	ND	ND	ND
SG-22	5	8/13/93	1	ND	6.5	55.5	2.9	ND	ND	ND	ND	ND
SG-23	5	8/13/93	1	ND	ND	45.2	ND	ND	ND	ND	ND	ND
SG-24	5	8/13/93	1	ND	9.8	71.3	5.2	1.4	ND	ND	ND	ND
SG-25	5	8/13/93	1	ND	ND	1.5	ND	ND	ND	ND	ND	ND
SG-26	5	8/13/93	1	ND	4.4	3.1	ND	ND	ND	ND	ND	ND
SG-27	10	8/13/93	1	ND	1.7	174.7	ND	19.1	ND	ND	ND	ND
SG-28	5	8/13/93	1	ND	5.9	64.8	ND	3.1	ND	ND	ND	ND

TOTAL XYLENES = Total combined para-, meta-, and ortho xylenes
TOL = toluene
TCA = 1,1,1-trichloroethane
EBENZ = ethylbenzene
DCE = 1,1-dichloroethene
PCE = tetrachloroethene
cis-1,2-DCE = cis-1,2-dichloroethene
TCE = trichloroethene
MC = methylene chloride

ND = Not Detected; Constituent is below the reportable limit of quantitation for this sample.

8/17/93.sl

Oct. 7
Oct. 16



EXPLANATION:

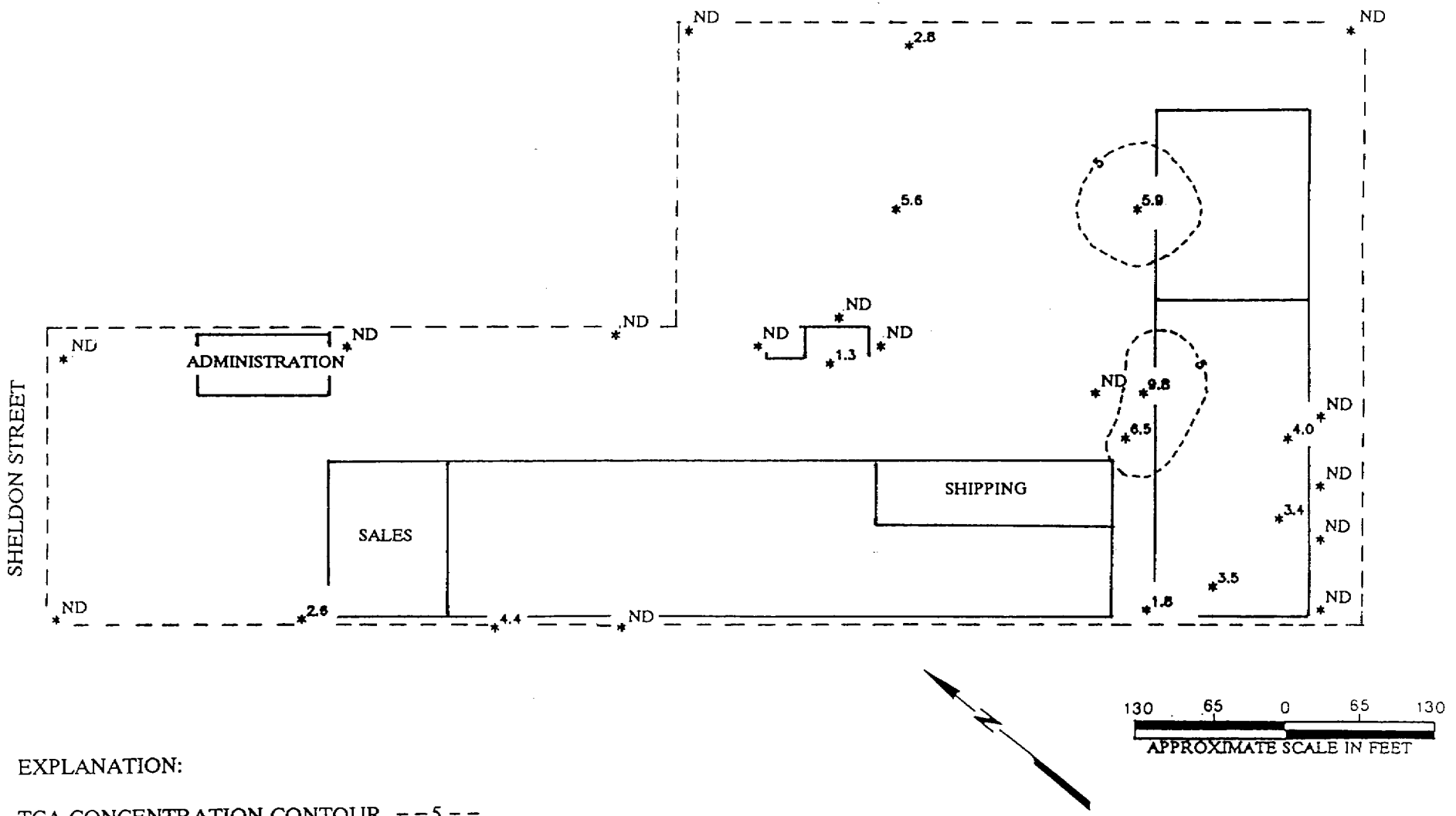
TCE CONCENTRATION CONTOUR --60--

SOIL GAS CONCENTRATION FOR TCE *20.0

ND = NONE DETECTED

SOURCE OF BASE MAP:
NUPLA CORPORATION

FIGURE 4
ISO-CONCENTRATION CONTOURS FOR TCE
AT 5-FEET BELOW GRADE (μg/L)
NUPLA CORPORATION SOIL GAS SURVEY



EXPLANATION:

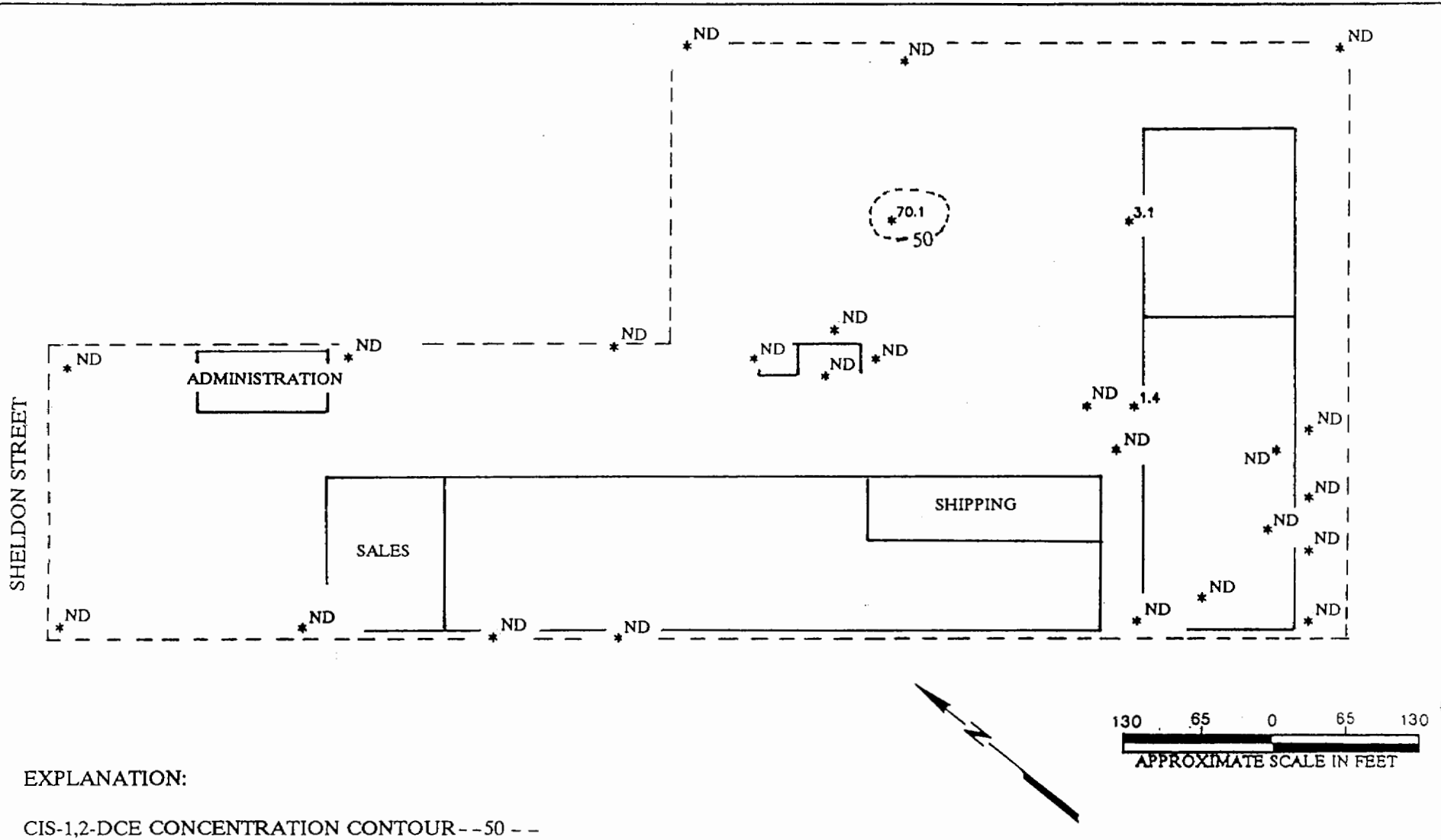
TCA CONCENTRATION CONTOUR --5--

SOIL GAS CONCENTRATION FOR TCA *4.0

ND = NONE DETECTED

SOURCE OF BASE MAP:
NUPLA CORPORATION

FIGURE 5
ISO-CONCENTRATION CONTOURS FOR TCA
AT 5-FEET BELOW GRADE (μg/L)
NUPLA CORPORATION SOIL GAS SURVEY



EXPLANATION:

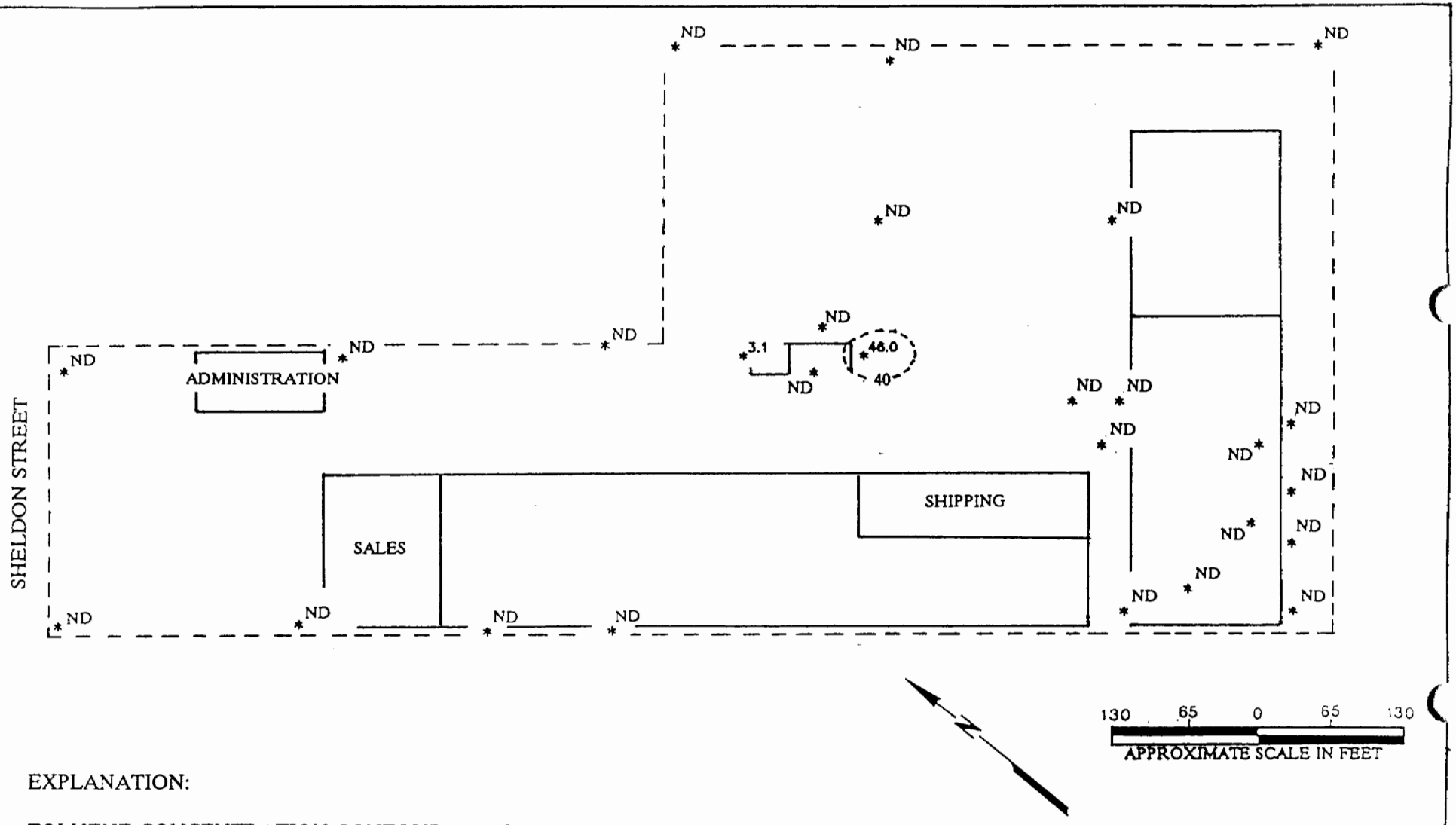
CIS-1,2-DCE CONCENTRATION CONTOUR - -50- -

SOIL GAS CONCENTRATION FOR CIS-1,2-DCE $*^{70.1}$

ND = NONE DETECTED

SOURCE OF BASE MAP:
NUPLA CORPORATION

FIGURE 6
ISO-CONCENTRATION CONTOURS FOR
CIS-1,2-DCE AT 5-FEET BELOW GRADE (μg/L)
NUPLA CORPORATION SOIL GAS SURVEY



EXPLANATION:

TOLUENE CONCENTRATION CONTOUR - - 40 - -

SOIL GAS CONCENTRATION FOR TOLUENE *46.0

ND = NONE DETECTED

SOURCE OF BASE MAP:
NUPLA CORPORATION

FIGURE 7
ISO-CONCENTRATION CONTOURS FOR TOLUENE AT 5-FEET BELOW GRADE ($\mu g/L$)
NUPLA CORPORATION SOIL GAS SURVEY

Soil gas concentrations of xylenes were detected in 2 of 28 probes sampled. Concentrations of xylenes ranged from 8.4 μg/L in Probe SG-3 to a maximum of 17.3 μg/L in Probe SG-1. Probe SG-1 is located on the north-east side of the chemical storage area.

A soil gas concentration of ethylbenzene was detected in 1 soil gas probe. Ethylbenzene was detected in Probe SG-3 at a concentration of 5.3 μg/L. Soil gas probe SG-3 is located in the proximity of the chemical storage area.

Concentrations of DCE were detected in 3 of 28 sampled soil gas probes. Detected concentrations of DCE ranged from 1.0 μg/L in Probe SG-7 to a maximum of 5.2 μg/L in Probe SG-24.

PCE was detected in 1 soil gas probe. A soil gas sample collected from Probe SG-7 contained a concentration of 2.1 μg/L of PCE.